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Sustainable initiatives of decreasing environmental impact of warehouse operations. Way to ISO 14000 for Logistikas Oy.

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Bachelor's thesis
April 2020
Technology, communication and transport
Degree Programme in Logistics Engineering

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jamk.fi

Description

Author(s)	Type of publication	Date
Solovev, Roman	Bachelor's thesis	April 2020
		Language of publication: English
	Number of pages: 66	Permission for web publication:

Title of publication
Sustainable initiatives of decreasing environmental impact of warehouse operations. Way to ISO 14000 for Logistikas Oy.

Degree programme
Logistics Engineering

Supervisor(s)
Ilola, Mikko; Karjalainen, Ville

Assigned by
Logistikas Oy

Abstract

Constantly growing consumer needs are increasing the volume of production, services and transportation, and all this has environmental impacts. The ecological methods for the regulation of the environmental impacts that are the focus of the ISO 140001 standard were developed by the International Standard Organization.

Examination of the ISO 14001 standard for establishing sustainable initiatives for diminishing warehouse operations' environmental impact at Logistikas Oy in Jyväskylä was determined as a challenge. Four main objectives were defined for achieving an environmentally friendly position in the market. These included the introduction of the ISO 14001:2015 standard as the key element of the strategy of Logistikas Oy, development of the steps for receiving an ISO 14001 certification, exploration of the environmental initiatives implemented by the company, and examination of the spheres for improvement in the processes of the company.

The quantitative research approach was chosen as it was considered to provide scientific, objective, focused and acceptable results. The study aimed to describe the current state in the branch in Jyväskylä for a hypothesis of a decision plan based on the characteristics, comparison and validation of the existing conditions. Reports on water, electricity, and heat consumption as well as waste volume were assembled. In addition, the daily operations were analyzed in terms of environmental impacts.

The significance of the implementation of ISO 14001 was reflected in the results. Proposals for developing sustainable initiatives for decreasing the environmental impact of the operations of the branch in Jyväskylä were presented. Successful elements of these proposals can be transferred to Logistikas Oy so that it could become an environmentally friendly company and achieve the certification.

Keywords/tags (subjects)
Warehouse operations, environmental impact, environmental management system

Miscellaneous (Confidential information)
This thesis is to be treated as confidential indefinitely.

Contents

Figures

Tables

Abbreviations

EMS - Environmental management system

ERP - Enterprise Resource Planning

IPPC - International Plant Protection Convention

ISO - International Organization for Standardization

ISPM - International Standards for Phytosanitary Measures

KPI - Key performance indicator

LED - Light-emitting diode

LULUCF - Land use, land use change and forestry sector

PVC - Polyvinyl Chloride

RFID - Radio-frequency identification

QMS - Quality Management System

UPM - United Paper Mills Ltd

VCI - Vapor Corrosion Inhibitors

1 Introduction

Every year the customer needs are increasing in the market, which leads to congestion in the warehouses, transportation hubs, and the fulfillment sector. In order to satisfy the needs of the market, probability of the environmental impact in these sectors is increasing, because of the usage of more resources, raw materials, and transport. However, any organization can be certified according to ISO 14001:2015, or the organizations may decrease their environmental effects through the actions according to the principles of the standard. Enhancement of these indicators begins with the precise definition of the key performance indicators (KPIs), which are significant to the environmental performance of companies and to awareness of actions that may allow environmental risk. (Nolan 2016)

1.1 Description of Logistikas Oy

Logistikas Oy was founded in 1997 as a logistics company, which has 130 professionals on the board. Currently, the company handles its own logistics centers with 80,000 square meters in six locations: Rauma, Olkiluoto, Nokia, Suolahti, Jyväskylä, and Uusikaupunki. According to data from 2017, the net sales of the company were 19 million euro along with the subsidiary Logistikas Hankinta Ltd. The comprehensive logistics management gives a competitive advantage for the customers of the company. The company provides local logistics, in-house logistics and immediate-proximity warehousing services for their customers. (Logistikas as a company 2019)

The cornerstones of Logistikas are transparency, information system, dynamism, the can-do attitude, and location. The open trust policy between the company and customers is a fundamental part of the transparency of the company's strategy in order to find the right decision and effective approaches. Regular monitoring and development of the operations are aspired to when improving the competitiveness of the customers. The regular monitoring and measuring the operations are provided by Logistikas-LogMaster, which was created by integrating the accounting system, work hours-tracking system, reporting tool, exception management system, and LogMaster. The application Logistikas-LogMaster is a part of the information system of the company. The supple and universal application can be used with more common ERP systems. The dynamism of the company consists of a dynamic, customer-focused and flexible response to the change of the customer needs. By directing significant resources and specific attention to finding the right people for each job and supporting their achievements, the company built one of the cornerstones, which is the can-do attitude concept with the experienced and committed employees. The last cornerstone of the company is the location, which is a significant aspect of the customer requirements. The company's own logistics centers and areas are placed close to the major ports along the west coast of Finland and within their natural zone of impact. (Logistikas values 2019)

1.2 Environmental policy of Logistikas

When analyzing the cornerstones of Logistikas, there is no mention of the company's attitude towards the environment, which in turn is a rather popular section of the strategy or part of sustainable initiatives among companies in the field of logistics and warehousing. Nevertheless, the company has set goals of sustainable development in the aspects of environmental management and the implementation of these principles. Therefore, the main purpose of the thesis was to identify the steps for achieving the ISO 14001 standards by taking the Jyväskylä branch office as an example.

Currently, the company has an ISO 9001 certification obtained from DNV GL. DNV is an international certification and classification society, the key competence of which is assessment, consulting and risk management (DNV GL 2020).

ISO 9001 is an internationally recognized quality management standard that aims to continuously improve the company's operations and increase customer satisfaction. ISO 9001 certification plays an important role in the implementation of sustainable business, as reducing errors gives the possibility to decrease costs. The quality certificate informs the company's customers that the processes in the organization meet their requirements. The certification is also clear evidence that the organization is systematically improving its performance. The key factors for a sustainable business include reliability, customer satisfaction, and continuous improvement. The quality system certification demonstrates the company's commitment to the factors. An effective management system ensures the company's ability to provide compatible products and services. (ISO 9001 – Laatujärjestelmä [Quality system] 2019)

In fact, Logistikas follows the right direction of development. This is because various companies regularly obtain ISO 14001 certificates based on previously received ISO 9001 certificates or because they apply for both certificates.

1.3 Research challenge, objectives, questions and motivation of the author

The research challenge of the thesis was the exploration of the ISO 14001 standard for the creation and application of sustainable initiatives for decreasing the environmental impact of warehouse operations in Logistikas' unit in Jyväskylä. Four core objectives of the thesis were defined by the author. The first objective was to examine the importance of introducing the ISO 14001:2015 standard as a part of the strategy of the company. The second objective was to develop a way of achieving ISO 14001 based on the ISO 9001 standard obtained by the company. The third objective was to study the environmental initiatives which have been implemented by the unit of Logistikas in Jyväskylä. The fourth objective was to examine the areas for improvement in the current operations of the company in order to develop an environmentally friendly organization.

Based on the information in the previous section, the following research questions were formed:

- Why is it crucial to introduce the ISO 14001:2015 standard as a part of the strategy of the company's strategy?
- How will the ISO 9001 standard be utilized for achieving the ISO 14001 standard?
- What actions are implemented by the unit of the company in Jyväskylä in terms of the environmental aspects?
- What is planned to improve the current operations of the warehouse in order to become an environmentally friendly organization? How will the responsibility for the implementation of the ISO 14001 standard be allocated between the management team of the company?

The motivation to examine the ISO 14001 standard for the creation and application of sustainable initiatives for decreasing the environmental impact of warehouse operations in Jyväskylä was based on the author's concern as an employee to work at an environmentally sustainable workplace. Therefore, the topic of the research was

considered as applicable as the results may be utilized by the unit of the company. Moreover, it is worth pointing out that the introduced initiatives can be used for the improvement of the operations in all units of the organization. Implementing the above-mentioned improvements may lead the company to obtaining the ISO 14001 certificate.

1.4 The structure of the thesis

The thesis consists of seven chapters, including introduction, theoretical basis, Research, strategy and implementation, research results, conclusions and discussion. The introduction chapter presents the company and describes its current environmental policy as well as the challenges of the study, its objectives and questions, and the motivation of the author. Moreover, the applicability of the topic is described in the first chapter.

The theoretical basis of the ISO 14001 standard, its benefits, model and certification are presented in the second chapter. Moreover, the chapter describes the integration of the certificate and research approach.

The research chapter investigates the identification of the environmental aspects in the areas with possibilities to implement improvements and the fields in which the company is not able to affect the development. The strategy and implementation chapter describes the importance of creating an environmental focus in the company as a goal and acquiring additional advantages in the supply chain as well as for the customers and society. The chapter also explains a possible way to interpose the certification into the company.

The research results chapter describes the possible solutions for the identified environmental aspects within the branch in particular, and possible improvements in the whole company. In addition, the chapter defines the distribution of responsibility within the management for compliance with the requirements of the certificate in the company.

The sixth chapter composes the entire paper. Based on analyzing the theoretical basis and the results of the thesis, conclusions are made in the chapter. The final chapter describes the possibility of further investigation of the topic with several examples of research challenges.

2 Theoretical Basis

This chapter describes the theory aspects, which provide full information of ISO 14001:2015, guidance and steps in order to achieve the right environmental policy in Logistikas.

2.1 ISO 14001 standard

The ISO 14000 family of standards gives practical tools for the companies and organizations, which aim to control their environmental responsibilities (ISO 14000 Family – Environmental Management 2019). ISO 14001 is an internationally agreed standard. The standard establishes the requirements for an environmental management system. (What is ISO 14001:2015? 2020.)

The ISO 14001 standard assists companies to refine their environmental performance via more efficient utilization of resources and reduction of waste as well as to gain a competitive edge and the trust of stakeholders. In general, the environmental management system aids companies to identify, operate, monitor and inspect their environmental problems in a comprehensive model. (ISO 14001 Key benefits 2015.)

There are other ISO standards that regard various types of management systems, which use a HighLevel Structure, including ISO 9001 for quality management and ISO 45001 for occupational health and safety. This suggests that ISO 14001 can be integrated readily into any existing ISO management system. ISO 14001 is appropriate for all types and sizes of companies, such as private, not-for-profit or governmental. (SCCM 2016, 19)

The organizations are required to take into account all environmental problems associated with their activities, such as water and drainage problems, air pollution, waste management, contamination of soil, climate change mitigation and adaptation as well as utilization of resources and efficiency (What is ISO 14001:2015? 2020). ISO 14001, such as all ISO management system standards, contains the necessity for continual enhancement of the systems of the organization and approaches to environmental issues. The standard was revised in 2015 in terms of the key improvements such as the increased value of environmental management as part of the strategic planning processes of the organizations, a larger input from the leadership and a stronger obligation to proactive initiatives that force environmental performance. (ISO 14001 Key benefits 2015)

2.2 Benefits of ISO 14001

The application of a strategic approach to improving environmental performance in a company is caused by various reasons. According to the users' report of the ISO 14001 standard, it helps to:

- Demonstrate compliance with the current and future legislative and regulatory requirements
- Increase leadership and employee engagement
- Improve organizational image and stakeholder confidence through strategic communication
- Achieve strategic business goals by integrating environmental issues into business management
- Ensure a competitive and financial advantage by increasing efficiency and reducing costs
- Integrate suppliers into the company's business systems, which leads to stimulation of their environmental performance

(ISO 14001 Key benefits 2015)

Certification Europe (2019), which is the international organization of the certification of ISO standards, defines a similar list of benefits by stating that the standards help to:

- Identify cost savings with larger importance on waste, resource, and energy management
- Evolve corporate reputation and trust
- Quantify, monitor and inspect the effect of operations on the environment, currently and in the future
- Provide legislative acquaintance and compliance
- Upgrade the environmental performance of the supply chain
- Protect the firm, assets, shareholders, and management team
- Potentially reduce public responsibility insurance costs for an organization
- Enlarge access of an organization to business partners and potential customers.

Moreover, additional information about the benefits of the ISO 14001 standard is discussed by Grovers (2017, 6-7) in their book. According to them, there are several advantages:

- Proactive approach rather than reactive
- Understanding stakeholders needs and expectations
- Improving resource efficiency
- Driving environmental commitments
- Decreasing waste
- Diminishing costs by conserving natural resources for sustainable progress
- Creating a culture to continually improve environmental performance
- Protecting the environment, including preventing or minimizing adverse effects
- Utilizing the perspectives of the life cycle in order to prevent the transfer of environmental impacts to the other parts of the cycle
- Developing communication with relevant stakeholders.

- Ensuring that environmental impacts are measured and controlled
- Enlarging opportunities for new business
- Magnifying stakeholder and client confidence

In general, the advantages of certification are similar in the opinion of different authors. Therefore, the online magazine ISO Update (2018) has identified the top five important reasons for certification:

- Certification requires senior management to be responsible for implementing and supporting the right environmental practices. Employee involvement is ensured by engaging a management team. General organization of the company to achieve one goal increases success.

- Certification helps improve the reputation and relationships with the stakeholders, and it also helps to increase trust from the public.
- Certification provides a competitive advantage for the company, especially in finding new customers.
- Regardless of the business, certification allows to identify the environmental problems of a particular company. This allows the company to manage and control these problems, and the company can identify risks and opportunities for their prevention or improvement.
- The employment of audits integrated in the certification guarantees the correct implementation of the management system. It also identifies potential risks and opportunities for improvement.

The major cause for implementing an environmental management system that use the requirements of ISO 14001 is to aid the environment by exerting less adverse effects and reducing the environmental impact. However, it is difficult for some organizations to protect the costs required to make the change. Apparently, easer way to justify the cost of the improvements is concentrating on other advantages, which can move beyond the elementary ideals of environmental management and center more on the long-term benefits of implementing an environmental management system. (Hammar 2015a)

2.3 Model of ISO 14001

The approach, which forms the basis of an environmental management system, is based on the Plan-Do-Check-Act (PDCA) concept. The PDCA model ensures an iterative process utilized by companies to reach continuous improvement. It can be employed in the environmental management system and each of its separate elements. (Sadiq, & Hayat Khan 2019, 11)

This can be tersely described as follows:

- Plan - create environmental goals and processes required to achieve results in conformity with the environmental policy of the company
- Do - realize the processes as planned
- Check - control and evaluate processes in accordance with the environmental policy, including its obligations, environmental purposes, and operating criteria, and communicate the results
- Act - take actions for continuous improvement

Figure 1 below shows how the structure represented in this International Standard can be injected into a PDCA model, which can assist new and existing users to grasp the importance of a systems approach. (ISO 14001:2015 Environmental management systems — Requirements with guidance for use 2015, 6)

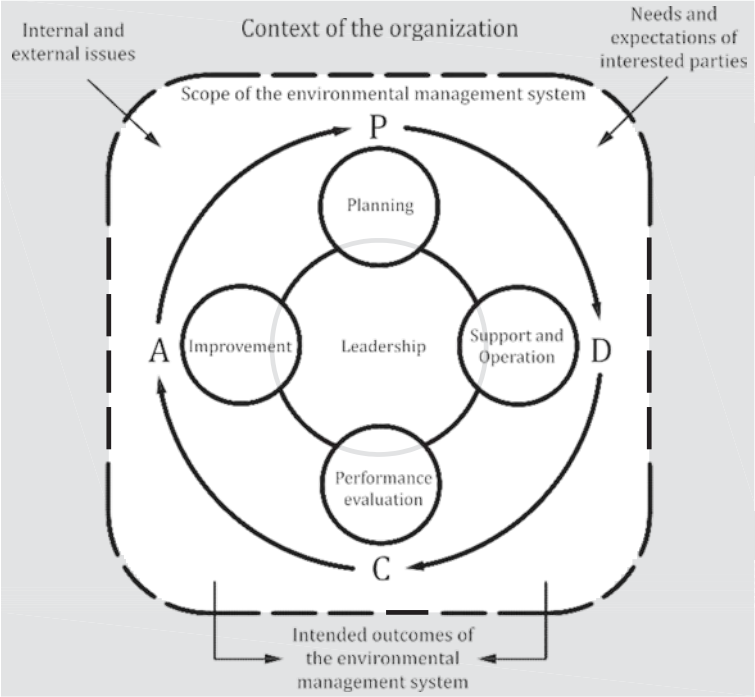

Figure 1. Relationship between PDCA and the framework in this International Standard (ISO 14001:2015 Environmental management systems — Requirements with guidance for use 2015, 6)

2.4 ISO 14001 certification

Accreditation according to the ISO 14001 certification is not a requirement, and companies can take advantage of using the standard without going through an accredited certification process (What is ISO 14001:2015? 2020). However, an independent expert opinion of a third-party organization of certification on compliance with the requirements of the standard gives the right to inform clients, customers, suppliers and other interested parties that the company has implemented the standard properly. Moreover, it helps some companies to show how they comply with regulatory or contractual requirements. (ISO 14001 Key benefits 2015)

Most certification organizations identify common steps for obtaining certification for customers. As an example, Imex International (2020) offers a globally proven implementation methodology for ISO 14001: 2015 certification. The organization highlights the following certification steps:

- Internal gap analysis
- Awareness training
- Identification and determination process
- Documentation of process design
- Documentation of process implementation
- Internal auditor training and internal audit
- Management review meeting
- Implementation overview
- Preliminary assessment
- Certification audit
- Obtaining ISO 14001 Certification

2.5 Certificate integration

When having an existing ISO 9001 system, it is theoretically easy to integrate the ISO 14001 system, since many processes are similar in both systems. When a company's quality management system complies with ISO 9001, the organization already has the following processes:

- Policy development and spread
- Goals creation and distribution
- Competency, preparation and awareness processes
- Management System Information Transfer
- Monitoring of system documentation
- Verification of records
- Control of discrepancies
- Corrective and preventative operations

- Inner audit
- Review by management

(Certified to ISO 9001? 2020)

The company has to renew the above-mentioned processes to comprise the new EMS information, but it is not required to make new processes to meet the EMS requirements. For example, the company has to determine which EMS records are being monitored, but the control and storage method will already be determined according to the existing process of the company. Regarding the inner audit and management review, the above-mentioned actions should include the revision and analysis for the environmental management. (Hammar 2015b.)

Core steps for the implementation of EMS in accordance with ISO 14001 will entail the utilization of existing processes, although some operations require the creation of new procedures. It is possible to highlight the foundation for the elements of EMS:

1. Environmental focus.
   Usage of the existing operations of the company for policy implementation and distribution to create a new policy or edit the company's existing QMS policy to comprise the purposes and guidelines needed to correctly lead the introduction and maintenance of the company's EMS.
2. Legal requirements
   This requires a new way that will allow the company to identify all environmental legal requirements applicable to the company. The way also needs to guarantee that the company operates in accordance with the requirements by monitoring changes as they occur. Knowledge of these requirements and their application in the company is decisive for the next step.
3. Environmental facets
   This is the second most important new process essential in conformity with ISO 14001. Using this process, the company will need to determine all the ways in which the company’s processes cooperate with the environment and evaluate which of them are important and which are not. Regarding considerable environmental facets, the company is later required to determine the

criteria and operational controls necessary for securing that these important aspects do not lead to significant negative environmental impacts.

4. Purpose, tasks and programs
   Although the company can use the existing process of creating and maintaining goals, the company needs to refurbish this process to include goals and programs, since this is not a mandatory requirement of ISO 9001. Then the company will need to create and manage new goals and objectives for environmental management, which are relevant environmental requirements.

(*Environmental Aspects and Impacts: In-depth* 2019)

By spending time on deciding which parts of the existing management system in the company can be applied to an integrated EMS, the staff can save time and effort in the long run, as these processes will already be identified, known, and supported. Thus, it will require less effort to engage employees in the work and because this significantly reduces the time required to implement EMS in the company. In order to make the management systems as efficient as possible, the company needs to avoid duplication of processes. (Hammar 2015b)

2.6 Research approach

There are two approaches to data collection and analysis: qualitative research and quantitative research. Quantitative research is based on work with numbers and statistics, while qualitative research is based on work with words and meanings. (Streefkerk 2019.)

The above-mentioned information is supported by McLeod (2019), who emphasizes that there is a fundamental difference between quantitative and qualitative data. According to McLeod (2019), quantitative data can be defined as numeric data, and qualitative data is characterized as descriptive, and it is related to a phenomenon which can be observed but not measured.

DeFranzo (2011) points out that creating numerical data to quantify a research problem can transform information into useful statistics. The quantitative research method is utilized to quantify attitudes, opinions, behavior and other specific variables, which can be summarized in the results of a wider sample set. This method allows the use of measurable data to formulate factors and identify patterns in research. DeFranzo (2011) is confident that such a method of collecting quantitative data is much more structured than methods for collecting qualitative data.

According to McLeod (2019), the collection of quantitative research data occurs in a numerical mold, which can be categorized either in ranking order or measured in units. Based on this type of data, it is possible to build graphs and tables of the raw data. Quantitative researchers aspire to build general laws of demeanor and phenomena in different conditions and contexts. Research is used to verify the theory and ultimately support or divert the approach. (McLeod 2019)

There are several methods for producing quantitative data, including experiments as one of the prominent methods, as they relate to the measurement of things. Notwithstanding, there are other methods of quantitative research, including controlled observations and questionnaires, which produce quantitative information. For instance, closed questions in a survey or grading scale produce quantitative data because they generate numeric data or data, which is possible to categorize. (McLeod 2019)

This opinion is also supported by Dudovskiy (2018a), who states that questionnaires can be classified depending on the pattern of the problem. Dudovskiy believes that the answers obtained using closed-ended questions with multiple choice answers are analyzed applying quantitative methods, and they may include pie-charts, histograms, and percentages. Dudovskiy (2018a) also points out that an important advantage of the questionnaires is the increased speed of data collection, low or cost-free requests and a higher level of objectivity matched to many alternative processes of collecting primary data. Furthermore, one should not forget that there are certain disadvantages with questionnaires. Dudovskiy accentuates that respondents choose

random answers without proper reading of the question and that there is no opportunity for the respondent to express their thoughts on this issue due to the lack of an appropriate column.

Experimental methods reduce the possible ways in which a participant of a study can respond and show a corresponding social demeanor. Thus, the results can be contextual and simply reflect the assumptions that the researcher brings to the investigation. (McLeod 2019.)

However, Dudovskiy (2018b) also agrees that experimental studies can be effective in analyzing the cause and effect of relationships. In order to test a hypothesis, the deductive approach is mainly used in experimental studies. Causal studies are the most frequent work for the application of experiments. In particular, experimental studies include manipulating an independent variable to evaluate its effect on dependent variables. (Dudovskiy 2018b.)

According to McLeod (2019), statistics assist to convert quantitative data into useful information that helps to make decisions. Using statistics, a researcher can summarize data, and describe patterns, relationships, and connections. Statistics can be descriptive or logical. Descriptive statistics aid to summarize data, while logical statistics are used to identify statistically significant differences between data groups (such as intervention and control groups in a randomized control study).

It would be unfair not to mention that the qualitative method is a useful way for certain types of research. As Streefkerk (2019) marks, a qualitative study is articulated by words. Streetfkerk believes that this type of research is used for comprehending concepts, thoughts or experiences.

The idea is also supported by DeFranzo (2011) who claims that qualitative research is primarily research. According to him, the main use of a qualitative research approach is to identify main causes, opinions and motives. This contributes to the perception of a problem or the development of an idea or hypothesis for potential quantitative

research. An important application of a qualitative study is the identification of trends in thinking and opinions and a deeper study of the problem. (DeFranzo 2011.)

The core objective of the thesis was to find ways for reducing the environmental impact and using resources efficiently in warehouse activities. Therefore, it was decided that the author would choose the quantitative research approach.

3 Research

The information of this chapter was deleted because of confidentiality.

4 Strategy and implementation

The information of this chapter was deleted because of confidentiality.

5 Research results

The information of this chapter was deleted because of confidentiality.

6 Conclusions

The main conclusion that can be drawn is that the research challenge of the thesis has been solved. Implementation of the ISO 14001 standard is possible in any organization, in particular this is possible in Logistikas. The author showed important aspects for obtaining certification that the company has to fulfill. Based on the Logistikas division in Jyväskylä, the author identified real and possible initiatives to reduce the environmental impact of warehouse operations.

Certainly, the implementation of the recommendations of the author is not enough to obtain certification for Logistikas, since the branches of the company are different from each other. However, the results provided the basis for the fulfillment of initiatives with similar cases. Analyzing the solutions proposed separately by the author, it may give the impression that these measures are insignificant, but by cooperating them in a single direction it is possible to improve and significantly reduce emissions and costs in the Jyväskylä branch. This can be illustrated by using the diagram showing the causes of certain events, called the Ishikawa Diagram (see Figure 18).

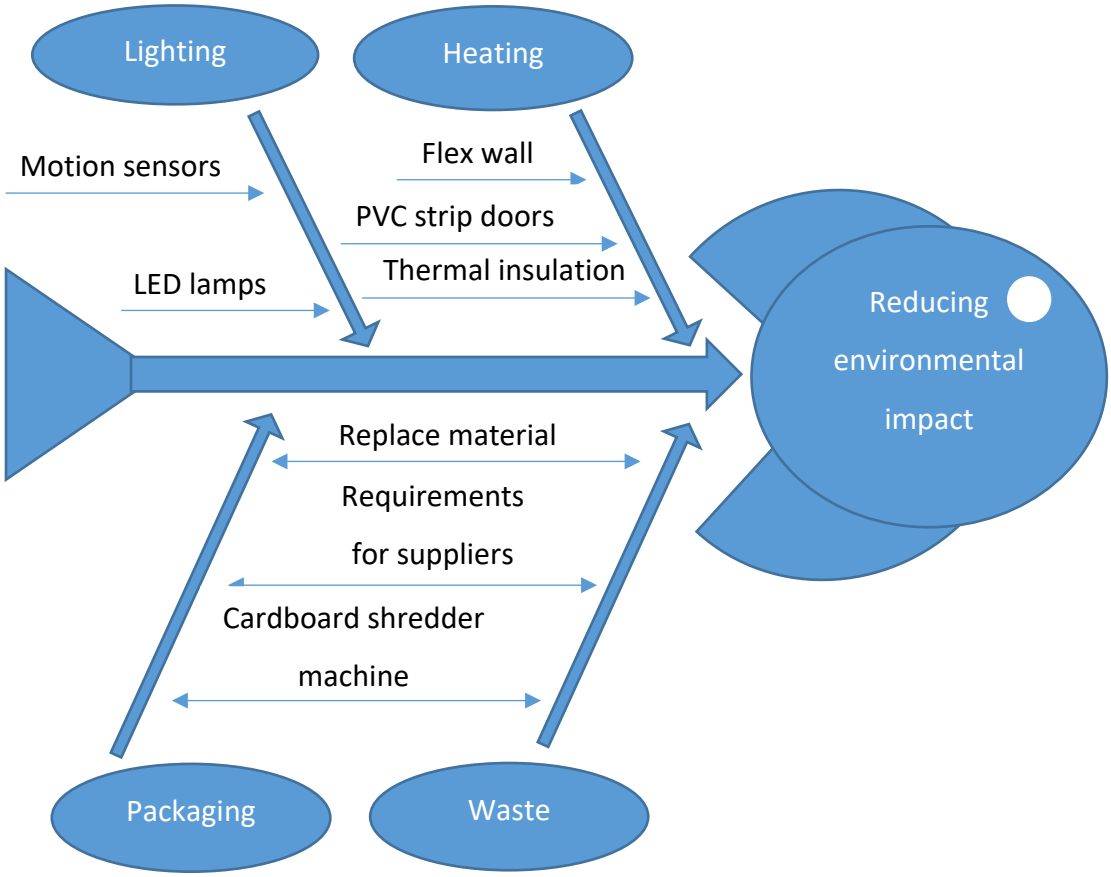

Figure 2. Fishbone Diagram of cause and effect

The author set four main goals in the Introduction chapter. In the Research chapter, the implemented environmental initiatives of the Logistikas Jyväskylä division were examined. The branch uses fluorescent lamps for lighting, which operate continuously for two work shifts. About half of the interior lighting was replaced by LED, but the rest lighting requires replacement, as well as street lights in the loading area. Heating is done by providing hot air through the ventilation, which is supplied from the nearest factory. However, such heating is not sufficient to maintain the optimum operating temperature during loading and unloading. A large amount of waste is generated due to the flow of plastic and cardboard received along with the spare parts from suppliers. The packaging uses a large amount of cardboard, cushioning paper, bubble wrap and plastic bags.

In chapter five the solutions to improve the current operations of the Jyväskylä branch were found, which are reflected in the Fishbone diagram above. Replacing with fully LED lighting will reduce the current consumption by 10% to 15%, and the installation of a system of motion sensors will reduce another 20% to 30%. The installation of thermal insulation, PVC strip doors and flex walls will reduce heat loss in the building and maintain a comfortable temperature inside. This will decrease heat consumption and maintain comfortable working conditions. Installing a cardboard shredder machine will allow to recycle waste cardboard into a suitable void filler material. This will reduce waste and expenses of purchasing special material for packing. The use of corrugated wrap, Hexcel wrap and boxes will reduce the use of plastic packaging. Building the right relationship with the suppliers will reduce the amount of non-recyclable material. The author also suggested possible improvements for the company, such as solar panels, geothermal heating and electric heaters.

In the Strategy and implementation chapter the author explained the importance of implementing the ISO 14001 standard in the concept of a company's strategy, its advantages and added value. This includes reducing energy and waste consumption, increasing processing volumes and lowering the cost of raw materials, increasing trust and giving the company the advantage over competitive tenders. Also, the author explained how to implement ISO 14001 smoothly on the basis of the existing ISO 9001 standard. To implement the certificate, the company needs to develop and communicate its goals and policy, train the personnel, compose a documenting process, analyze the main causes and corrective actions for non-compliance, organize an internal audit and enlist the support of the management for the review meetings. The presence of the ISO 9001 standard allows the company to use the already passed stages of certification, introducing several new processes and procedures and adapting attention to its environmental footprint.

The fifth sub-chapter of the fifth chapter, in which the author proposed a simplified model of the distribution of responsibility between the company's management and staff, is equally important. The top management of the company should allocate responsibilities and authority for the respective roles in EMS. This puts EMS at the center of decision making and strategic planning. Each branch should have an authorized

employee with the appropriate qualifications and level of knowledge. This employee should report the effectiveness of the EMS in the branch directly to the top manager and coordinate actions to improve productivity and adjustments.

7 Discussion

The ISO 14001 standard requires continuous improvement in decreasing environmental impact for the company. This is an issue for future research to explore. As the requirements for ecology are growing, respectively, the technological industry in the field of environmental innovation or improvement is developing rapidly. For instance, the lighting has turned into LED, which has become very accessible and versatile. Moreover, the renewable energy improves energy efficiency, and the industry creates special machines for processing waste, finds the ways to reuse materials in various spheres of human life or improves materials. This list can be continued but the meaning remains the same, this area is developing and the interest in research will only grow. Within the company case, the author did not take into account water problem, because the consumption of water is averagely stable and low. However, there is possibility for further examination of the effectiveness of installing sensor taps in terms of saving water. More than that, the supply chain between the organization and customers can be investigated in terms of the ways of decreasing emissions of transport operations. As indicated above, the industry is developing rapidly and new types of packaging, which may be introduced in the future.

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